EXPANDED SITE INSPECTION

FOR

GREENTOWN DUMP

(a.k.a. Miller Landfill)

Greentown, Stark County
U.S. EPA ID: OHD002342509

Prepared by:

OHIO ENVIRONMENTAL PROTECTION AGENCY
Division of Emergency & Remedial Response

Date: September 29, 1999

EXPANDED SITE INSPECTION

Greentown Dump
a.k.a Miller Landfill

Greentown, Ohio

U.S. EPA ID: OHD002342509
Date: September 29, 1999

Prepared &
Reviewed by: Michael J Eberle Date: 9-29-99
Michael J. Eberle, Site Coordinator, Northeast District Office
Division of Emergency & Remedial Response
Ohio Environmental Protection Agency

Reviewed by: Steven Love Date: 9/29/99
Steve Love, Environmental Supervisor, Northeast District Office
Division of Emergency & Remedial Response
Ohio Environmental Protection Agency

Prepared &
Reviewed by: M Eberle (for) Date: 9-29-99
Diane Crosby, Site Investigation Field Unit-Central Office
Division of Emergency & Remedial Response
Ohio Environmental Protection Agency

Approved by: Jeanne Griffin Date: 9/30/99
Jeanne Griffin
Early Action Project Manager
Division of Superfund
U.S. Environmental Protection Agency

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

1.0 EXECUTIVE SUMMARY

Ohio Environmental Protection Agency (Ohio EPA) personnel conducted an Expanded Site Inspection (ESI) at the former Greentown Dump Site, Stark County, Ohio. The Expanded Site Inspection was performed under the United States Environmental Protection Agency (U.S. EPA) site investigation protocol. The purpose of this Expanded Site Inspection was to determine if the disposal practices at the Greentown Dump released contaminants into the environment, specifically to ground water, surface water/sediment and/or soil.

2.0 INTRODUCTION

The Ohio Environmental Protection Agency (Ohio EPA) Division of Emergency and Remedial Response (DERR) formed a cooperative agreement with the U.S. EPA Region V to conduct an Expanded Site Inspection of the Greentown Dump, U.S.EPA ID# OHD002342509 *(Latitude: N 40^{O} 55' 25.0" Longitude: W 081^{O} 23' 10.0").* This report was prepared to address potential effects the site has to the surrounding areas.

3.0 SITE BACKGROUND

3.1 Site Description

The Greentown Dump site is located in Stark County, Ohio approximately one mile east of the city of Greentown at 2365 State Street NW. (Figure 1). The site consists of a 155 acre parcel sloping from an elevation of 1250 ft. above the mean sea level (AMSL) on the western portion of the site to an elevation of 1130 ft. AMSL along the eastern portion of the site. The area surrounding the site is zoned residential/agricultural. A large pond, which is used for fishing, is located in the southwest portion of the site and a small pond is located in the northeast portion of the site. Greentown Auto Parts, a retail store selling rebuilt auto parts and supplies, operates on the site just off of State Street in the southwest portion of the site. The property owner currently lives on the site directly off of State Street just east of Greentown Auto Parts.

The southwest quadrant of the site is currently used as a junk/salvage yard and contains two large warehouse/barn structures, the auto parts store, the owners residence, several hundred discarded vehicles, several dozen 55-gallon drums of unknown origin, demolition debris, discarded building materials and a multitude of auto parts. This area is easily traversed as it contains many dirt roads weaving in and out of the vehicles and debris. The northern portion of the site is fairly heavily wooded with the exception of the central portion which contains a cleared area, access road and small farm field. The southeast and eastern edge of the property is made up of farm field. The

central strip of land on the site contains the area with the greatest slope and is also the location of a former strip mine and landfill.

The site is bordered to the north and east by farm fields and to the west by residential property and to the south by State Street. Directly across State Street are residential properties and farm fields. The areas to the west and northwest of the Greentown Dump have a relatively high elevation and relief than the adjacent areas to the east, south, and the north. Based on these slopes, surface water in the Greentown Dump site area is expected to flow toward the Nimishillen Creek to the east and its two tributaries to the north of the site area. An unnamed tributary to the West Branch of the Nimishillen Creek flows northeast from the northeast portion of the site and drains an unnamed pond on site as well as surface water run-off. The West Branch of Nimishillen Creek borders the site to the east and flows in a southern direction. Several other features of the surrounding area include Lake O'Pines to the east, several gas wells, strip mines and Greentown Park to the west. There are residential areas with many drinking water wells to the south, southwest, west and northwest of the site.

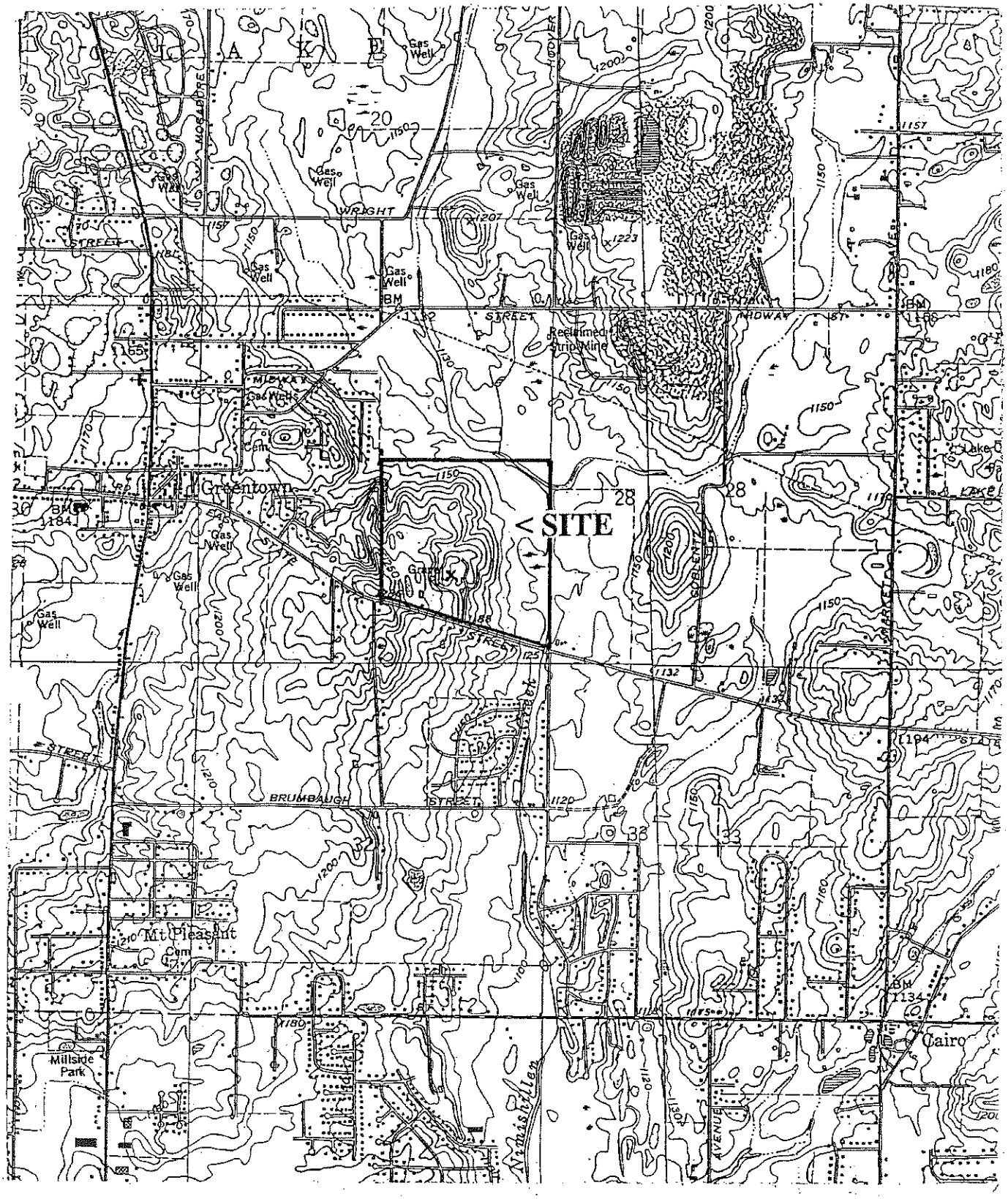


Figure 1
Greentown Dump
(a.k.a. Miller Landfill)
Site Location Map

HARTVILLE, OHIO
40081-H3-TF-024
1960
PHOTOREVISED 1984
DMA 4765 IV NE-SERIES V852

NORTH CANTON, OHIO
40081-H4-TF-024
1967
PHOTOREVISED 1984
DMA 4765 IV NW-SERIES V852

QUADRANGLE LOCATION

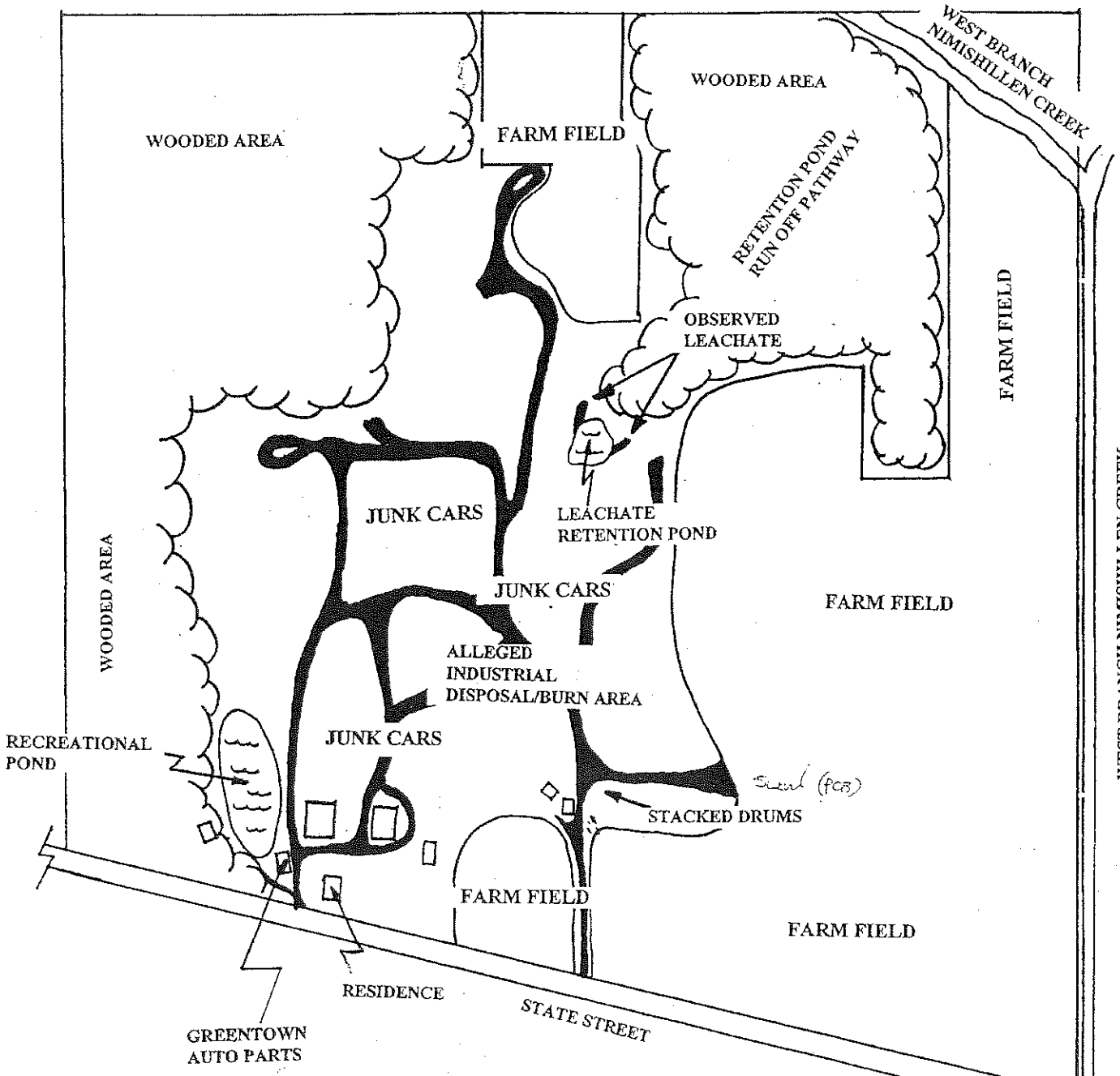
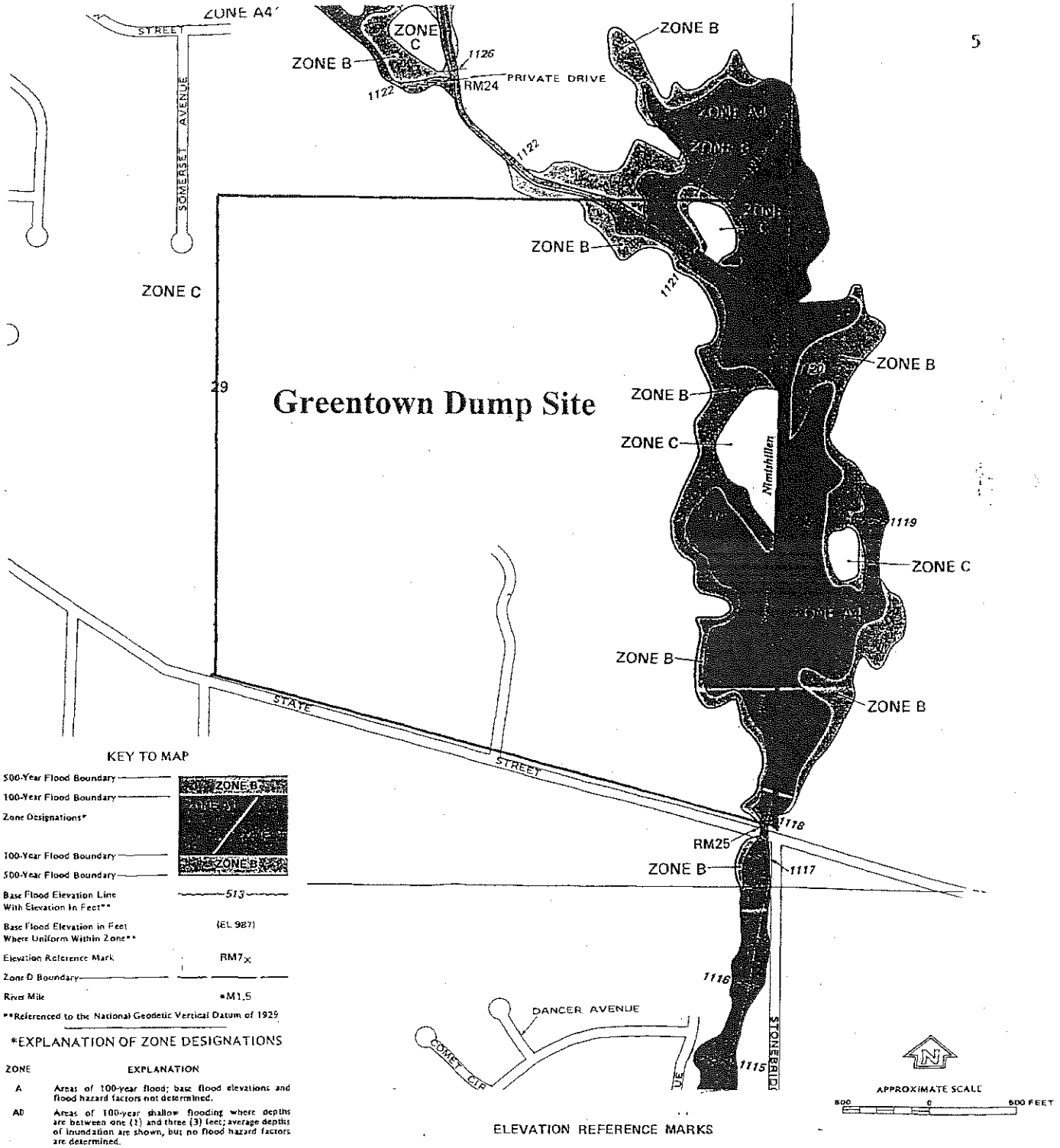


FIGURE 2:
Greentown Dump
(a.k.a. Miller Landfill)
Site Features Map



KEY TO MAP

500-Year Flood Boundary	
100-Year Flood Boundary	
Zone Designations*	ZONE B / ZONE A1 / ZONE B
100-Year Flood Boundary	
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7 x
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

ELEVATION REFERENCE MARKS

FERENCE MARKS	ELEVATION FEET (NGVD)	DESCRIPTION OF LOCATION
RM 24	1124.33	Top of south end of corrugated metal pipe culvert for West Branch Nimishillen Creek under private drive, about 0.6 mile east of intersection of Bellhaven Street and Greenbranch Street.
RM 25	1121.71	Railroad spike in power pole No. 12/28 located on north side of State Street, about 40 feet west of West Branch Nimishillen Creek.
RM 26	1115.53	Stark County standard disk set in northwest headwall of Brumbaugh Street bridge over West Branch Nimishillen Creek.
RM 27	1103.91	Southwest corner of south headwall of Mount Pleasant Street bridge over West Branch Nimishillen Creek.

FIGURE 3:
Greentown Dump
Flood Insurance Rate Map

3.2 Site History

The Greentown Dump / Miller Landfill was originally operated by Mr. Paul Miller and is now run by Mr. Jim Miller, his son. Before obtaining a permit to accept landfill material, the site was a strip mine and mined to an unknown depth. After receiving a permit, the landfill was in operation during the span 1965-1969. The operations at the landfill site included acceptance of solid waste such as household, commercial, and industrial rubber waste. In 1966, the landfill was prohibited from accepting industrial rubber waste by the Stark County Health Department. While in operation the landfill serviced Canton, North Canton, Hartville, Uniontown, Greensburg as well as South Akron residents. The dump is presently used as a junk yard for discarded vehicles.

Letters, located in Ohio EPA files, from anonymous citizens, indicate that due to operation hours of the Industrial Excess Landfill (IEL), Uniontown, Ohio, waste originally designated for disposal at IEL may have been disposed of at the Greentown Dump site. IEL is currently an active Superfund site located approximately 3 miles north of Greentown.

Stark County Health Department files were reviewed for information detailing compliance with their standards. These files contained reports on quarterly inspections conducted by the department and showed no violations were present on the site. These inspections included a visual survey of the property in order to detect possible seepage from the cap or landfill itself.

3.3 Previous Site Work

Previous site work includes a one-time residential well sampling effort for volatile organic compounds (VOCs) by the Ohio Environmental Protection Agency. This sampling event took place on October 11, 1995 and consisted of nine area wells being sampled. There were no VOCs detected in the water samples for the time and date of this event.

Previous site work includes an Integrated Assessment completed by the Ohio EPA on September 28, 1998. Upon completion of this report, Ohio EPA recommended that an additional investigation be conducted at the site in the form of an Expanded Site Inspection (ESI). This recommendation was based on multiple hits of various contaminants including barium, lead , PCB's, multiple VOCs and SVOCs. The main area of concern centered around the ground water pathway along with the surface water pathway.

3.4 Site Geology & Hydrology

Soils

The Greentown Dump area was overlain twice by continental glaciers, associated with the Grand River Lobe, during the Illinoisan and Wisconsin of the Pleistocene Epoch (Delong and White, 1963; White, 1982). According to the glacial map of Stark County, this site and the areas to the north and

south are covered with kame deposits (WKk) consisting predominantly of sand and gravel. Whereas, the areas to the east are covered with end moraine (WKe) consisting of sandy till. Both these units are related to Kent-Navarre ice advance during the Wisconsin glaciation.

According to the soil maps of Stark County (Christman et al., 1971), the main soil types in the Miller Landfill site area are Chili Series (CpC2, CoC, CpB, CnB), Wooster Series (WuC2, WuB), Fitchville Series (FcA), and Loudonville Series (LoB). The Chili Series is extensively developed on stream terraces, outwash plains, and kames. These soils are well-drained, rich in sand and gravel, and have moderately high to high permeability. The Wooster Series, formed on glacial till, is well-drained and has moderate permeability. Loudonville soils are formed on silty loam or glacial till and are underlain by sandstone and siltstone. These soils of this series are moderately well to well drained and moderately permeable. The Fitchville Series is developed on silty sediments. In contrast to other soil types, the Fitchville soils are poorly drained and have moderately low permeability.

Geology/Hydrogeology

Lithologic logs indicate the presence of zero to approximately 75 ft thick unconsolidated sediments consisting of clay, sand, and gravel. Bedrock from the top generally consists of a thick sequence of shale containing minor amounts of limestone and coal, a sandstone bed, and shale.

The upper surface of the bedrock ranges in elevation from 1010 ft to 1202 ft. Bedrock surface slopes to the east in areas to the south of State Street and slopes to the west in Greentown. The bedrock surface elevation ranges from 1061 to 1105 feet AMSL near the Nimishillen Creek.

The overlying shale sequence is absent at several locations. Thus, the underlying sandstone bed is in direct contact with the unconsolidated sediments. These locations are relatively close to the Nimishillen Creek or its tributaries.

In the Greentown Dump area, the aquifers in the unconsolidated sediments are unconfined. The unconsolidated sediments, wherever present, consist of sand, clay, gravel, and mud. Stratigraphically, the bedrock aquifers range from unconfined to confined. However, because of the presence of fractures or leakage through the confining layer, stratigraphically confined bedrock sandstone aquifers may behave hydro geologically as unconfined or semi-confined aquifers. Because of this reason no differentiation is made during the preparation of water table elevation contour map between the wells that are drilled down to the bedrock sandstone or to the underlying beds from those wells that did not reach the bedrock sandstone.

Pumping tests conducted by drillers at wells that included residential, non-residential, and wells of unknown use indicted a large variation in Drayton. The observed Drayton ranges from 0 feet after 0.5 hour pumping at 30 g.p.m. to 250 feet after 0.3 hour pumping at 15 g.p.m..

The elevation of the water table ranges from 1065 ft to 1185 ft . Water table elevation contour maps indicate a complicated pattern of ground water contours. These contours suggest ground water flow directions at the west of the landfill site vary from the northeast to southwest .

Contaminant Hydrogeology:

Since Greentown Dump site contains industrial, commercial, and domestic wastes, it can potentially release a variety of contaminants. A detailed characterization of the potential contaminants in the source area has not been completed. Thus, site specific contamination indicator parameters are not well defined at the landfill area. Analysis of the surface water samples collected by Ohio EPA from on site, upstream, and downstream in 1973-1974 indicated exceedences of secondary maximum contaminant levels (SMCLs) of aluminum, iron, manganese, and sulfate. These samples were not analyzed for volatile organic compounds (VOCs). Thus, the presence of VOCs in these surface water samples cannot be ruled out.

The contaminants leached from the landfill may be transported by surface water runoff downward to the north and northeast from the source area. Ground water also can transport contaminants from the landfill area. Contaminants dissolved in ground water may migrate vertically downward through vertical or near vertical fractures in bedrock. The lack of confining shale sequence on the sandstone aquifer in some areas would favor a downward migration of contaminants into deeper aquifers. The slope of the bedrock surface near the Miller Landfill site would also cause heavy contaminants [Dense Nonaqueous Phase Liquids, DNAPL)], if any, to migrate toward the east, northeast, and north.

The potential paths of lateral spreading of the contaminants dissolved in ground water and the contaminants lighter than water [Light Nonaqueous Phase Liquid (LNAPL)] appear to be toward the east or northeast. Ground water samples were collected by Ohio EPA in 1995 from residential wells located two-three thousand feet toward the northwest, south, and southwest from the Miller Landfill and along East State Street to investigate whether the landfill has affected the ground water quality. These samples detected no VOCs to suggest any potential release from the Greentown Dump. The latter possibility, however, cannot be ruled out because at the time of sampling the ground water flow direction was unknown and the sample locations may not be located on the paths of contaminant migration.

For a detailed evaluation of the contaminant hydrogeology at the Greentown Dump area, it is necessary to characterize the contaminants based on analysis of ground water samples from the site and to determine the direction of hydraulic gradient based on additional water table elevation data from or close to the site. The presence of fractures in bedrock may influence the ground water flow direction and should be taken into consideration during the interpretation of hydraulic gradient into ground water flow direction. For an accurate determination of ground water flow direction, a pumping test with the pumping well and monitoring wells properly positioned with respect to the

fracture orientations may be needed.

Conclusion

The bedrock at the Greentown Dump and adjacent areas comprises a thick sequence of shale with subordinate amounts of limestone and coal underlain by one or more sandstone and shale beds. With two exceptions, bedrock in all locations is covered with a variable thickness of unconsolidated sediments consisting of sand, gravel, and clay. The aquifers in unconsolidated sediments are unconfined. Bedrock aquifers in most areas are stratigraphically confined, but may behave as unconfined or semiconfined because of fractures. The ground water flow direction at the west of the landfill site varies from northeast to southwest. At the landfill site the ground water flow direction is probably toward the east or northeast. Because of the presence of fractures and the lack of confining layers in some areas, DNAPLs, if released, may migrate downward or follow the eastward slopes of the impermeable bedrock surface. The lateral direction of ground water flow and migration of dissolved contaminants and LNAPLs at the Greentown Dump area appear to be toward the east or northeast. This flow direction, however, may be influenced by the presence and orientation of fractures in the bedrock.

4.0 SAMPLING LOCATIONS & DISCUSSION OF RESULTS

Soil, ground water, leachate and residential well samples, were collected during the ESI sampling event on April 6-7, 1999 (figure 4). Soil, leachate and ground water samples were analyzed by U.S. EPA Contract Laboratory Program (CLP) laboratories. Resident well samples were analyzed by Region V's Central Regional Laboratory (CRL). Analyses included the following parameters: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs, TAL metals, and cyanide.

Complete analytical results for the ESI are contained in Appendix A . Significant findings based on these data are summarized in Tables 1,2 and 3 . Data were reviewed by USEPA Region V personnel for compliance with the CLP, and validated by CRL staff.

Standard quality assurance and quality control (QA/QC) procedures for site investigation field activities were followed during the investigation. These procedures, including sample collection, packaging and shipping, and equipment decontamination, are documented in the Quality Assurance Project Plan (QAPP) for Region V Superfund Site Inspection Activities for Ohio EPA and Ohio EPA Field Standard Operating Procedures.

4.1 Groundwater

Six (6) ground water samples were collected with the Ohio EPA GeoProbe™, including duplicate samples, from various on-site locations (figure 4). Eight (8) residential well samples were also

collected at locations surrounding the Greentown Dump site. These samples were collected to further assess if suspected contamination at the Greentown Dump site is contributing to potential ground water contamination in the area (figure 4). Refer to Table 4 for specific addresses for each sampling location.

The first discussion will deal with the six (6) GeoProbe™ samples collected. There was difficulty in finding ground water during this investigation. If ground water was found, there was usually very low volume of water. At some of the locations we were only able to collect part of the scheduled parameters.

Sample GP-2 was collected in a farm field north of State Street and east of an access road (figure 4). Refusal was reached at 18 feet. The sample contained elevated levels of aluminum at 99.6 ppm, arsenic at .150 ppm, barium at .933 ppm, chromium at .162 ppm, cobalt at .163 ppm, copper at .733 ppm, iron at 475 ppm, lead at .465 ppm, magnesium at 146 ppm, nickel at .351 ppm, potassium at 19.9 ppm, selenium at .0175 ppm, thallium at .0178 ppm, vanadium at .204 ppm, and zinc at 1.5 ppm. No semi-volitile organic compounds (SVOC), volitile organic compounds (VOC), pesticides or PCBs were detected at this location.

There were no elevated levels of contaminants detected in sample GP-3. Sample GP-4 was collected approximately 300 yds. north of State Street and east of the base of a slope in a grassy strip. There were elevated levels of the VOC 1,1,1-trichloroethane at .058 ppm and trichloroethene at .012 ppm. TAL metals detected included aluminum at 36 ppm, arsenic at .215 ppm, barium at .893 ppm, chromium at .0603 ppm, cobalt at .086 ppm, copper at .361 ppm, iron at 232 ppm, lead at .229 ppm, magnesium at 67.7 ppm, manganese at 8.6 ppm, nickel at .207 ppm, potassium at 112 ppm, selenium at .138 ppm, vanadium at .091 ppm and zinc at 1.07 ppm. No SVOCs or pesticides were detected in sample GP-4.

Sample GP-5 was collected at the northern edge of a hilltop northeast of the leachate retention pond. Refusal was reached at 10.5 feet. TheVOC chloroethane was detected in this sample. TAL metals detected include aluminum at 50.6 ppm, arsenic at .025 ppm, barium at 2.18 ppm, beryllium at .017 ppm, chromium at .619 ppm, cobalt at .598 ppm, copper at .714 ppm, iron at 443 ppm, lead at .266 ppm, magnesium at 88.9 ppm, manganese at 6.7 ppm, nickel at .909 ppm, potassium at 33.9 ppm, thallium at .0164 ppm, vanadium at .334 ppm and zinc at 2.5 ppm. No SVOCs or pesticides were detected in the sample.

Sample GP-8 was collected at the southwest corner of the recreational pond on the southwestern edge of the site. Refusal was reached at 51 feet. Contaminants of concern include the TAL metals aluminum at 50.6 ppm, arsenic at .256 ppm, barium at 1.12 ppm, chromium at .155 ppm, cobalt at .108 ppm, copper at .280 ppm, iron at 330 ppm, lead at .277 ppm, magnesium at 23.9 ppm, manganese at 14.7 ppm, nickel at .260 ppm, thallium at .0103 ppm, vanadium at .109 ppm and zinc at .848 ppm. No VOCs, SVOCs or pesticides were detected.

Sample GP-11 was collected in the agricultural field just north of a dump area at northern most edge of site. Refusal was reached at 14.5 feet. Contaminants of concern detected include the TAL metals aluminum at 505 ppm, arsenic at .511 ppm, chromium at .089 ppm, cobalt at .122 ppm, copper at .379 ppm, iron at 260 ppm, lead at .312 ppm, magnesium at 130 ppm, manganese at 9.8 ppm, nickel at .261 ppm, potassium at 9.6 ppm, vanadium at .114 ppm and zinc at 1.5 ppm. No SVOCs, VOCs, pesticides or cyanide were detected in this sample.

Eight (8) residential well samples were collected at residences within a four-mile radius of the site. Some of these residences were sampled during the Integrated Assessment sampling event. They were re-sampled to confirm results and to see if any additional contaminants have leached into the ground water from the site. The only contaminants detected include TAL metals iron at 1.39 ppm, magnesium at 55.3 ppm, manganese at .346 ppm, and zinc at .233 ppm. These levels were the highest detected in the eight samples collected. No VOCs, SVOCs, pesticides or cyanide were detected in any of the samples.

4.2 Surface Water

A total of two (2) surface water/leachate samples were collected during the ESI sampling event. These samples were collected in a ravine in the western portion of the site near a farm field and an access road (figure 4). There was only enough volume to collect two VOA samples. The only contaminant detected was 1,1-dichloroethane at .015 ppm.

4.3 Soil

A total of four (4) soil samples, including a background sample were collected. Soil samples were collected to determine the potential for direct exposure of contaminants to the public and to determine the potential for migration of the contaminant from surface and sub-surface soils to Nimishillen Creek and the tributary ditches on site. All soil sample locations were chosen based on historical records, aerial photographs and physical appearance of potential source areas. The following is a discussion of soil sample locations and results. Refer to Table for significant findings.

Sample SO-1 was collected at a depth of 0-6" in a ravine in the western portion of the site by an access road and farm field (figure 4). Contaminants detected include the pesticide 4,4-DDE at 4.7 ppm, endosulfan II at 4.0 ppm, 4,4-DDD at 4.1 ppm and aroclor-1254 at154 ppm. TAL metals detected include copper at 84.1 ppm, mercury at 0.39 ppm and zinc at 294 ppm.

Sample SO-2 was collected at the same location as SO-01, but the sample depth was at 1-2'. The only contaminants of concern detected were the TAL metals copper at 26.9 ppm, iron at 59700 ppm, selenium at 0.80 ppm and thallium at 3.7 ppm.

Sample SO-3 was collected from the surface on the northeast side of the site where barrels were

found full of an unidentified liquid. The Ohio EPA Special Investigation Unit took a sample from inside two of the drums. Contaminants of concern detected in the soil near the 55-gallon drums include the TAL metals barium at 673 ppm, cadmium at 13.3 ppm, chromium at 188 ppm, copper at 774 ppm, iron at 52600 ppm, magnesium at 5090 ppm, mercury at 2 ppm, nickel at 102 ppm, selenium at 4.4 ppm, silver at 13.3 ppm, thallium at 2.2 ppm, zinc at 1930 ppm and cyanide at 2.5 ppm. SVOCs detected include 4-chloroaniline at 1100 ppm, fluoranthene at 340 ppm, pyrene at 410 ppm, butylbenzylphthalate at 490 ppm, bis(2-ethylhexyl)phthalate at 2700 ppm, benzo(b)fluoranthene at 730 ppm, benzo(a)pyrene 370 ppm, indeno(1,2,3-cd)pyrene at 690 ppm and benzo(g,h,i)perylene at 870 ppm. Pesticides detected include dieldrin at 95 ppm, endrin at 32 ppm, endosulfan II at 20 ppm, 4-DDD at 85 ppm, methoxychlor at 29 ppm, endrin ketone at 3.9 ppm, alpha-chlordane at 159 ppm and gamma-chlordane at 127 ppm. No VOCs were detected.

As stated above, the Ohio EPA Special Investigations Unit sampled two drums from the area north of the swale that runs along the fill area. Three samples were taken from the two drums (GTD-01, GTD-02, GTD-03). This was done to capture results from a layering effect found in one of the drums. The following are the results from the analysis of these samples.

GTD-01	GTD-02	GTD-03
PCB - none-detect	PCB - 12 ppm Aroclor 1254	PCB - none-detect
Flash - 212°	Flash - 192°	Flash - 161°
TCLP Vol. - non-detect	TCLP Vol. - 2.1 ppm MEK - non-hazardous	TCLP Vol. - 4.0 ppm MEK - non-hazardous

4.4 Air

No air samples were taken as part of the Greentown Dump ESI.